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EXAMINER

SAUNDERS JR, JOSEPH

ART UNIT

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/706,772	<b>Applicant(s)</b> ASADA ET AL.	
	<b>Examiner</b> Joseph Saunders	<b>Art Unit</b> 2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 04 February 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 February 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

1. This office action is in response to the communications filed February 4, 2008.

Claims 1 – 5 are currently pending and considered below.

### ***Double Patenting***

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1 – 5 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 2 and 11 of copending Application No. 10/533,612. Although the conflicting claims are not identical, they are not patentably distinct from each other because.

**Claim 1:** Application No.10/533,612 discloses a method of reproducing an audio signal, comprising the steps of: supplying an audio signal to a plurality of digital filters (“supplying an audio signal to each of a plurality of digital filters,” claim 1), and producing a respective plurality of filtered signals; generating a sound field inside a closed space by supplying the plurality of filtered signals from the plurality of digital filters to a respective plurality of speakers constituting a speaker array signals (“supplying outputs from the plurality of digital filters to a plurality of speakers arranged in a speaker array to form a sound field,” claim 1); and focusing (“setting a predetermined delay time in each of the plurality of digital filters so that transmission delay times with which the **audio signal arrives at a first point** in the sound field via each of the plurality of digital filters and each of the plurality of speakers **will coincide with each other**,” claim 1 ) sounds outputted from the speaker array to a location of a listener inside a sound field after being reflected by a wall surface (“after it is reflected by a wall surface,” claim 2) of the closed space with a sound pressure greater than a sound pressure at a peripheral location (“a low-pass characteristic will be given to a synthesis response of the audio signal at a second point in the sound field,” claim1) in the closed space by setting predetermined respective delay times for said plurality of digital filters, respectively (“setting a predetermined delay time,” claim1).

**Claim 2:** Application No.10/533,612 further discloses the method of reproducing an audio signal according to claim 1, wherein the sound pressure directly arriving at said listener from said speaker array is reduced by setting predetermined respective

Art Unit: 2615

amplitudes in said plurality of digital filters (“adjusting an amplitude characteristic,” claim1).

**Claims 3 – 5:** Application No.10/533,612 also discloses in claim 11 an apparatus performing the method disclosed above, therefore claim 11 also discloses the same invention of claims 3 – 5. With regards to the newly claimed filter coefficients of claim 5, it is inherent that the Application No.10/533,612 also uses filter coefficient since digital filters require filter coefficients in order to allow “each of the plurality of digital filters has a predetermined delay time so that transmission delay times with which the **audio signal arrives at a first point** in the sound field via each of the plurality of digital filters and each of the plurality of speakers **will coincide with each other**,” claim 11).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Claim Rejections - 35 USC § 102***

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1 – 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Bienek et al. (WO 02/078388 A2), hereinafter Bienek.

**Claim 1:** Bienek discloses a method of reproducing an audio signal (method and apparatus to create a sound field), comprising the steps of: supplying an audio signal

Art Unit: 2615

(input signal 101) to a plurality of digital filters (delay means 1508 or adjustable digital filter 1512 can also be arranged to apply delays), and producing a respective plurality of filtered signals; generating a sound field inside a closed space by supplying the plurality of filtered signals from the plurality of digital filters to a respective plurality of speakers constituting a speaker array (Description of Figure 6, Pages 18 – 19); and focusing sounds outputted from the plurality of speakers of the speaker array to a location of a listener inside a sound field after being reflected by a wall surface of the closed space with a sound pressure greater than a sound pressure at a peripheral location in the closed space by setting predetermined respective delay times for said plurality of digital filters, respectively.

“If the signal delay applied by the signal delay means (1508) and/or the adaptive digital filter (1512) is chosen such that the sum of the delay plus the sound travel time from that SET (104) to a chosen point in space in front of the DPAA are for all of the SETs the same value - ie. so that sound waves arrive from each of the output transducers at the chosen point as in-phase sounds - then **the DPAA may be caused to focus sound at that point, P**. This is illustrated in Figure 7C.

As can be seen from Figure 7C, the delays applied at each of the output transducers (104a through 104h) again increase, although this time not linearly. **This causes a curved wave front F which converges on the focus point such that the sound intensity at and around the focus point (in a region of dimensions roughly equal to a wavelength of**

**each of the spectral components of the sound) is considerably higher than at other points nearby,”** Third Sound Field, Pages 21 – 22 and Figure 7C.

**“The first aspect of the invention relates to the use of a DPAA in a multichannel system. As already described, different channels may be directed in different directions using the same array to provide special effects.** Figure 8 schematically shows this in plan view the array (3801) is used to direct a first beam of sound (B1) substantially straight ahead towards a listener (X). This can be either focussed or not as shown in Figures 7A or 7B. **A second beam (B2) is directed at a slight angle, so that the beam passes by the listener (X) and undergoes multiple reflections from the walls (3802), eventually reaching the listener again. A third beam (B3) is directed at a stronger angle so that it bounces once of the side wall and reaches the listener.** A typical application for such a system is a home cinema system in which beam B1 represents a centre sound channel, beam B2 represents a right surround (right rear speaker in conventional systems) sound channel and beam B3 represents a left sound channel. Further beams for the right channel and left surround channel may also be present but are omitted from Figure 8 for clarity. As is evident, the beams travel different distances before reaching the user. For example, the centre beam may travel 4.8m, the left and right channels may travel 7.8m and the

surround channels travel 12.4m. To account for this, an extra delay can be applied to the channels which travel the shortest distance so that each channel reaches the user substantially simultaneously,” Page 24

Description of Figure 8.

It is noted that Figure 7C referenced above also illustrates focusing or directing sound as shown in Figure 7B and is also disclosed as achieving the first aspect of the present invention. Therefore Bienek clearly anticipates focusing sounds outputted from the plurality of speakers to a location of a listener inside a sound field after being reflected by a wall surface.

**Claim 2:** Bienek discloses the method of reproducing an audio signal according to claim 1, wherein the sound pressure directly arriving at said listener from said speaker array is reduced by setting predetermined respective amplitudes in said plurality of digital filters (Third Aspect of the Invention, Pages 26 – 27 and Figure 11).

**Claim 3:** Bienek discloses an apparatus for reproducing an audio signal (method and apparatus to create a sound field), comprising: a plurality of speakers (output transducer 104) constituting a speaker array (array 105); and a plurality of digital filters (delay means 1508 or adjustable digital filter 1512 can also be arranged to apply delays) to which an audio signal (input signal 101) is supplied for producing a plurality of filtered signals, wherein a sound field is generated inside a closed space by supplying the plurality of filtered signals from said plurality of digital filters to said plurality of speakers,



Art Unit: 2615

respectively (Description of Figure 6, Pages 18 – 19); and wherein sounds outputted from the plurality of speakers of the speaker array are focused at a location of a listener inside the sound field after being reflected by a wall surface of the closed space with a sound pressure greater than a sound pressure at a peripheral location by setting predetermined respective delay times for said plurality of digital filters in the closed space.

“If the signal delay applied by the signal delay means (1508) and/or the adaptive digital filter (1512) is chosen such that the sum of the delay plus the sound travel time from that SET (104) to a chosen point in space in front of the DPAA are for all of the SETs the same value - ie. so that sound waves arrive from each of the output transducers at the chosen point as in-phase sounds - then **the DPAA may be caused to focus sound at that point, P**. This is illustrated in Figure 7C.

As can be seen from Figure 7C, the delays applied at each of the output transducers (104a through 104h) again increase, although this time not linearly. **This causes a curved wave front F which converges on the focus point such that the sound intensity at and around the focus point (in a region of dimensions roughly equal to a wavelength of each of the spectral components of the sound) is considerably higher than at other points nearby,**” Third Sound Field, Pages 21 – 22 and Figure 7C.

**“The first aspect of the invention relates to the use of a DPAA in a multichannel system. As already described, different channels may be directed in different directions using the same array to provide special effects. Figure 8 schematically shows this in plan view the array (3801) is used to direct a first beam of sound (B1) substantially straight ahead towards a listener (X). This can be either focussed or not as shown in Figures 7A or 7B. A second beam (B2) is directed at a slight angle, so that the beam passes by the listener (X) and undergoes multiple reflections from the walls (3802), eventually reaching the listener again. A third beam (B3) is directed at a stronger angle so that it bounces once of the side wall and reaches the listener. A typical application for such a system is a home cinema system in which beam B1 represents a centre sound channel, beam B2 represents a right surround (right rear speaker in conventional systems) sound channel and beam B3 represents a left sound channel. Further beams for the right channel and left surround channel may also be present but are omitted from Figure 8 for clarity. As is evident, the beams travel different distances before reaching the user. For example, the centre beam may travel 4.8m, the left and right channels may travel 7.8m and the surround channels travel 12.4m. To account for this, an extra delay can be applied to the channels which travel the shortest distance so that each**

channel reaches the user substantially simultaneously,” Page 24

Description of Figure 8.

It is noted that Figure 7C referenced above also illustrates focusing or directing sound as shown in Figure 7B and is also disclosed as achieving the first aspect of the present invention. Therefore Bienek clearly anticipates focusing sounds outputted from the plurality of speakers to a location of a listener inside a sound field after being reflected by a wall surface.

**Claim 4:** Bienek discloses the apparatus for reproducing an audio signal, according to claim 3, wherein a sound pressure directly arriving at said listener from said speaker array is reduced by setting predetermined respective amplitudes in said plurality of digital filters (Third Aspect of the Invention, Pages 26 – 27 and Figure 11).

**Claim 5:** Bienek discloses an apparatus for reproducing an audio signal in a desired space (method and apparatus to create a sound field), said apparatus comprising: a plurality of speakers (output transducer 104) constituting a speaker array (array 105); and a plurality of digital filters (delay means 1508 or adjustable digital filter 1512 can also be arranged to apply delays) coupled directly or indirectly to a source (input signal 101) and respectively to said plurality of speakers, said plurality of digital filters having filter coefficients associated therewith (“It is noted that the ADFs can be arranged to apply delays to the signal by appropriate choice of filter coefficients,” page 12 lines 3 – 4), said plurality of digital filters being operable to receive an audio signal from said

Art Unit: 2615

source and to produce therefrom a plurality of filtered signals and to supply said plurality of filtered signals or signals corresponding thereto to said plurality of speakers so as to cause a sound field to be generated therefrom in the desired space (Description of Figure 6, Pages 18 – 19), and said filter coefficients having values such that sounds outputted from the plurality of speakers of the speaker array are focused at a location of a listener inside the desired space after being reflected by a wall surface of the desired space with a sound pressure greater than a sound pressure at a peripheral location.

“If the signal delay applied by the signal delay means (1508) and/or the adaptive digital filter (1512) is chosen such that the sum of the delay plus the sound travel time from that SET (104) to a chosen point in space in front of the DPAA are for all of the SETs the same value - ie. so that sound waves arrive from each of the output transducers at the chosen point as in-phase sounds - then **the DPAA may be caused to focus sound at that point, P.** This is illustrated in Figure 7C.

As can be seen from Figure 7C, the delays applied at each of the output transducers (104a through 104h) again increase, although this time not linearly. **This causes a curved wave front F which converges on the focus point such that the sound intensity at and around the focus point (in a region of dimensions roughly equal to a wavelength of each of the spectral components of the sound) is considerably higher than at other points nearby,”** Third Sound Field, Pages 21 – 22 and Figure 7C.

**“The first aspect of the invention relates to the use of a DPAA in a multichannel system. As already described, different channels may be directed in different directions using the same array to provide special effects. Figure 8 schematically shows this in plan view the array (3801) is used to direct a first beam of sound (B1) substantially straight ahead towards a listener (X). This can be either focussed or not as shown in Figures 7A or 7B. A second beam (B2) is directed at a slight angle, so that the beam passes by the listener (X) and undergoes multiple reflections from the walls (3802), eventually reaching the listener again. A third beam (B3) is directed at a stronger angle so that it bounces once of the side wall and reaches the listener. A typical application for such a system is a home cinema system in which beam B1 represents a centre sound channel, beam B2 represents a right surround (right rear speaker in conventional systems) sound channel and beam B3 represents a left sound channel. Further beams for the right channel and left surround channel may also be present but are omitted from Figure 8 for clarity. As is evident, the beams travel different distances before reaching the user. For example, the centre beam may travel 4.8m, the left and right channels may travel 7.8m and the surround channels travel 12.4m. To account for this, an extra delay can be applied to the channels which travel the shortest distance so that each**

channel reaches the user substantially simultaneously,” Page 24

Description of Figure 8.

It is noted that Figure 7C referenced above also illustrates focusing or directing sound as shown in Figure 7B and is also disclosed as achieving the first aspect of the present invention. Therefore Bienek clearly anticipates focusing sounds outputted from the plurality of speakers to a location of a listener inside a sound field after being reflected by a wall surface.

### ***Response to Arguments***

5. Applicant's arguments filed February 4, 2008 with regards to the provisional double patenting rejection under 35 U.S.C. 101 as claiming the same invention as that of claims 2 and 4 of copending Application No. 10/533,612 have been considered but are moot in view of the new ground(s) of rejection necessitated by the amendment. Although the language used in copending Application No. 10/533,612 is not identical, Application No. 10/533,612 still discloses in claim 1 “focusing” sound or “setting a predetermined delay time in each of the plurality of digital filters so that transmission delay times with which the **audio signal arrives at a first point** in the sound field via each of the plurality of digital filters and each of the plurality of speakers **will coincide with each other**” (emphasis added).

6. Applicant's arguments February 4, 2008 regarding the rejection of claims 1 – 5 under 35 U.S.C 102(b) Applicant states, “the Examiner appears to assert that the description of the "Third Sound Field" on pages 21-22 and Figs. 7C and 8 of Bienek

Art Unit: 2615

disclose the above features of claim 1. In response, although such portions of Bienek appear to mention focusing sound, such portions do not appear to disclose "focusing sounds outputted from the plurality of speakers to a location of a listener inside a sound field after being reflected by a wall surface.," however does not explain why Figure 8 and associated description does not disclose "focusing sounds outputted from the plurality of speakers to a location of a listener inside a sound field after being reflected by a wall surface." Citations of the relevant passages from Bienek have been added to the rejection above with emphasis added to clearly point out that Figure 8 illustrates, "A second beam (B2) is directed at a slight angle, so that the beam passes by the listener (X) and undergoes multiple reflections from the walls (3802), eventually reaching the listener again. A third beam (B3) is directed at a stronger angle so that it bounces once of the side wall and reaches the listener," and therefore anticipates "focusing sounds outputted from the plurality of speakers to a location of a listener inside a sound field after being reflected by a wall surface". If the sounds were not focused or directed off of a wall before arriving at the user as alleged by Applicant, then the sounds would not arrive at the user from different directions as clearly taught in the citations above and therefore would not have a multichannel effect. Therefore, Applicant's arguments are unpersuasive and the rejection is maintained.

### ***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Saunders whose telephone number is (571) 270-1063. The examiner can normally be reached on Monday - Thursday, 9:00 a.m. - 4:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571) 272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Art Unit: 2615

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. S./

Examiner, Art Unit 2615

/Sinh N Tran/

Supervisory Patent Examiner, Art Unit 2615